

tor populations in farmland. Strategies under study include farmscaping (e.g., raptor perches, owl nest boxes, trees), changes in cultural practices (e.g., tolerating pests, leaving crop debris on ground, reduced chemical inputs), and landscape engineering (e.g., revegetating potential corridors), all of which will contribute to farming efficiency, the aesthetic value of the landscape, and to the goals of biological conservation.

**RAIN FOREST RAPTOR COMMUNITY IN SUMATRA:  
THE CONSERVATION VALUE OF TRADITIONAL  
AGROFORESTS**

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Managed agroforests increasingly replace natural forests in western Indonesia. The raptor community of three of the richest types of agroforests was compared to that of the primary forest and to the open cultivated areas, using 1-km<sup>2</sup> sample plots. Both species richness and density in agroforests were more than twice as high as in cultivated areas, but they were twice as low as in primary forests. The twelve raptor species recorded were divided into four groups according to their increasing tolerance to forest degradation or management. Six species had no viable population outside mature natural forest and three species were more abundant in primary forest than elsewhere. The last three species were more frequent in agroforests but only one of them was absent from the primary forest. It is concluded that agroforests conserve no more than a quarter of the original forest raptor community and provide an adequate habitat for only one additional open woodland species. An even smaller subset of species was found in the little wooded cultivated areas.

**GENERAL SCIENTIFIC PROGRAM**

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**DNA PROFILE TESTING OF VANCOUVER AND CALIFORNIA POPULATIONS OF BALD EAGLES**

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In this study we attempted to assay the genetic composition of bald eagles (*Haliaeetus leucocephalus*) involved in the California reintroduction program using multi-locus DNA probes. Two populations were sampled: birds of California natal origin ( $N = 18$ ) and birds of Vancouver, B.C. natal origin ( $N = 10$ ). Both populations of eagles are a potential source for colonization of California bald eagle habitat via expansion of the existing population or the release of birds. The California bald eagle population has experienced a genetic bottleneck—genetic variation within the popula-

tion is much less than that observed in a more geographically confined population that has not experienced depletion. In addition, only one allele appeared at a  $>0.25$  frequency in both populations. This fact coupled with the number of distinct alleles found in each population indicated that crossbreeding of the two populations would increase genetic diversity.

**HARPY EAGLE (*HARPIA HARPYJA*) NESTING IN  
MANIPULATED FORESTS**

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Continental records point to shooting, removal of young and destruction of nests as the primary conservation problems for harpy eagles (*Harpia harpyja*); bird-observer visits are a new source of concern. Nesting events are roughly 3 yr apart. Nests are used during and after intensive manipulation of the surrounding habitat, and minimum distance between active sites was 3–5 km. In nine nesting sites along a 100-km stretch of the Imalaca Mountains in Venezuela, we fitted five fledglings with satellite-tracked tags from NASA. One of these birds was hacked with the help of the loggers who destroyed its nest. All these nests were active while logging ensued. Out of three re-nesting attempts, one failed when the nest collapsed. We salvaged two additional fledglings found in captivity. We are monitoring five nests in the buffer area of the Darien National Park in Panama, all within 3 km of human settlements where trees are regularly felled for firewood, lumber, and to clear more cropland. Eagles have been killed at two sites, a third site remains inactive since 1991, and the other two nests currently have fledglings.

**SEXUAL SIZE DIMORPHISM AND FOOD REQUIREMENTS OF  
NESTLING AMERICAN KESTRELS**

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Food requirements of dependent sons and daughters have important implications for evolution of the sex ratio, according to current sex allocation theory. We studied food requirements of nestling American kestrels (*Falco sparverius*), a moderate-sized, dimorphic falcon, by hand-feeding 61 birds from hatching to fledging. Daughters, the larger gender, consumed 6.99% more food than did sons. Sons did not have higher energy expenditure, from higher effort during sibling competition, than daughters did, so parents must supply more food to satisfy daughters' needs than to